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APPARATUS

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MAGNETIC FOOT THERAPEUTIC APPARATUS

CROSS REFERENCE TO RELATED APPLICATIONS

This application is a continuation-in-part of U.S. Patent Application Serial Number 10/318,552, filed December 13, 2002, which claims the benefit of U.S. Patent Application Serial No. 10/087,135, filed February 28, 2002, which claims the benefit of U.S. Provisional Patent Application Serial No. 60/272,384 filed February 28, 2001. These applications are incorporated by reference as if fully stated herein.

BACKGROUND

5 Various devices may have been made to create time-varying magnetic fields for use on the human body. Generally, two types of time-varying magnetic fields may have been used. The first type may use an alternating current ("AC") field that is produced when electric current is caused to alternate at any given frequency. In accordance with Maxwell's equations, a magnetic field is concurrently produced at the
10 same frequency as the electric field. Included in this first type of time-varying magnetic field device may be pulsed electromagnetic fields (PEMF) which are generated when a current is caused to move through a conductor in discrete impulses of electric charge moving in the same direction.

A second general type of device that may be used for creating time-varying
15 magnetic fields involves physically moving a static magnetic field through space.

While linear displacement may be one way to accomplish this, another common method may be rotating the static magnetic field.

The source of the static magnetic field may be generally a permanent magnet, since an electromagnet may require considerable expenditure of energy in the form of current generation and the subsequent dissipation of unwanted heat energy.

The therapeutic uses of time-varying magnetic fields may have been described and clinically evaluated in numerous literatures. The more popular publications written for the general public may include "Magnetic Therapy" by Dr. Ronald Lawrence and Dr. Paul Rosch, "The Pain Relief Breakthrough" by Dr. Julian Whitaker and Brenda Adderly, and "Magnetic Therapy in Eastern Europe" by Dr. Jiri Jerabek and Dr. William Pawluk. These books may offer numerous references to clinical studies which purport to show the effectiveness of time-varying magnetic fields for the treatment of a multitude of chronic and acute conditions including atherosclerosis, carpal tunnel syndrome, chronic bronchitis, post-ischemic injury, edema, fractures, infected wounds, limb grafts, burns, scars, macular degeneration, etc. The lack of any substantial negative side effects is also purported for most treatments. In recent years, the general public and even the medical community may have increasingly accepted magnetic therapy as an alternative treatment worthy of consideration for such conditions.

When people suffer from pain, they may usually ingest analgesics from their doctors. Some of them may also seek help from physical therapists to relieve their pain, if it is musculo-skeletal in nature. Furthermore, many people may be willing to purchase all sorts of pain-relieving devices that may be available on the market as home

remedies. The most common devices may be products in which pressure is applied to the soles of the feet, such as massage shoes and insoles.

It may have been known for some time that electrical activity in some form is involved in many aspects of human physiology. For instance, electrical activity may have been measured during the regeneration of bone. In addition, it may be well documented that many cellular responses are dictated by electrical gradients generated in the cell (for example, nerve cells). Therefore, it may be possible that exposure of the human body to a pulsating electromagnetic field could produce a beneficial physiological response in the body. In fact, several studies may have shown beneficial effects of pulsating electromagnetic field therapy.

Foot massage devices may have been sold on the market for years. Most may provide stimulation to the feet via mechanical vibration of surface plates that contact the feet. Other devices may provide a bath basin such that the feet may soak in a solution while the device produces heat and vibration to simultaneously or separately stimulate the feet. Furthermore, magnetic pads may have been used and marketed for years. These devices may rely on static magnetic fields to produce therapeutic effects.

Dynamic magnetic fields may have enhanced therapeutic effects. However, dynamic fields that may be currently utilized may be generated by electromagnetic devices that produce pulsed electromagnetic fields (PEMF), or alternating current (AC) electromagnetic fields. These types of dynamic electromagnetic fields may not provide the same characteristics of dynamic electromagnetic fields produced by rotating permanent magnets. The magnetic flux lines created by PEMF or AC electromagnetic

fields may vary in density and intensity in a time varying cyclical manner. Furthermore, the path of the flux lines may not change unless the device is manually positioned at different angles with respect to the treatment area. Rotating permanent magnets may produce dynamic electromagnetic fields that continually change in flux density and flux path. Additionally, if the permanent magnets rotate in two axes simultaneously, an added dimension of flux density may be created.

It may be advantageous to provide a therapeutic foot device that may utilize dynamic magnetic fields created by rotating permanent magnets. Furthermore, it may be advantageous to provide more and varied paths of flux movement to a treatment area.

SUMMARY

Exemplary embodiments disclosed herein are directed to a magnetic therapy device, which may include a rotatable housing, a first magnetic element configured to rotationally couple to said rotatable housing, a second magnetic element adjacent to said rotatable housing that affects the rotation of said first magnetic element, such that said first magnetic element simultaneously rotates about two axes, and an enclosure configured to enclose the magnetic therapeutic device, and configured to receive a portion of a body for treatment.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a perspective view of an exemplary embodiment of a foot energizer system.

Figure 2 is a perspective view of an exemplary embodiment of the interior of a foot energizer system.

Figure 3 is a perspective view of an exemplary embodiment of the mechanical force configuration of a foot energizer system.

Figure 4 is a perspective view of an exemplary embodiment of a magnetic biaxial rotating system.

DETAILED DESCRIPTION

The detailed description set forth below in connection with the appended drawings is intended as a description of exemplary embodiments and is not intended to represent the only forms in which the embodiments may be constructed and/or utilized.

The description also sets forth the functions and the sequence of steps for constructing and operating the invention in connection with the illustrated embodiments. However, it is to be understood that the same or equivalent functions and sequences may be accomplished by different embodiments that are also intended to be encompassed within the spirit and scope of the invention.

A foot energizing energizer system is shown in Figure 1 generally at 10. System 10 may include an enclosure 20, which may include an upper portion 22 and a lower portion 24. Upper portion 22 may have body access areas, or therapy area 26 configured to allow a user to position a body part adjacent the system for treatment.

Furthermore, system **10** may be configured with a handle configuration **28** that would allow easy transport of the entire system.

Enclosure **20** may be made of a hard plastic or metal, but may be made of other materials, as desired. Upper portion **22** may be configured to couple to lower portion **24** to form the enclosure **20**. Upper portion **22** and lower portion **24** may be coupled via screws, bolts, rivets, a snap configuration, or other coupling configurations, as desired.

Body access areas **26** may include heat elements **30** configured to transfer heat to the user's body while using the system. In this manner, heat may be transferred to soothe and comfort a user's body, as desired. Body access areas **26** may be made of a soft rubber, with an irregular surface such that if the system **10** or body access areas **26** vibrate, it would provide massage-like motion for the treatment area. Furthermore body access areas may be generally horizontal to allow a foot of a user to be adjacent thereto. With this configuration, a user may place their feet upon the device to receive treatment from the device.

Figure 2 shows the portions of the system **10** that may reside inside enclosure **20**. System **10** further may include a force system including a motor assembly **34** that may provide rotational force for the entire system. System **10** may also include a belt **36** that may be rotationally coupled to the motor assembly **34** such that the belt may move when the motor assembly is activated. System **10** may also include one or more casings **40** that may be configured to couple to rotatable housings **42**.

Rotatable housings **42** may be able to couple to a first magnetic element **44** such

that the first magnetic element may rotate within rotatable housing 42. System 10 may also further include a second magnetic element 46 that may be adjacent casing 40 and/or rotatable housing 42, such that it may affect the rotation of rotatable housing 42 and/or first magnetic element 44.

5 Rotatable housing 42 may be configured to rotationally couple to belt 36 such that when the motor assembly 34 is activated, belt 36 may move, rotatable housing 42 may then rotate within casing 40, thus causing first magnetic element 44 to rotate about a vertical axis. Furthermore, second magnetic element 46 may cause first magnetic element 44 to rotate in a horizontal axis that may be somewhat perpendicular to the first
10 axis of rotation. In this manner, first magnetic element 44 may rotate in two or more axes simultaneously.

Motor assembly 34 may include a motor gearing, pulleys and other devices such that it may transfer motion to belt 36, however, other configurations may be utilized, as desired. Belt 36 may be made from a rubber or nylon material, but also may be a chain
15 or drive-belt, or other device that may translate rotational motion to the rotatable housings, as desired.

Casing 40 may be made from a milled aluminum or other metal, but may be made from other materials such as, but not limited to, hard plastic or other material. Casing 40 may be mounted to the lower portion 24 of enclosure 20 via screws or bolts
20 and stanchions, however other fastening methods may be utilized, as desired.

Rotatable housing 42 may be made of a milled aluminum or metal material, but other materials may be utilized, as desired. Rotatable housing 42 is configured to

rotatably couple to casing 40. This may be accomplished via bearings or other type of rotatable coupling, as desired. First magnetic element 44 may include an axle that extends through first magnetic element 44 and may then be secured on either side of first magnetic element 44 within rotatable housing 42. The axle may be secured to rotatable housing 42 via a bearing, or other rotatable coupling method.

It will be appreciated that although first magnetic element 44 is shown as being coupled to rotatable housing 42 via machine screws and bearings, other coupling configurations may be utilized, such as, but not limited to, bolts, adhesives, rivets, nails, clamps and orifices being configured directly in casing 40. Additionally, first magnetic element 44 may be coupled to rotatable housing 42 via bearings that fit into an orifice formed within rotatable housing 42.

Figure 3 may show an exemplary embodiment of the system 10 without the enclosure. Again, the system may include a motor assembly 34, belt 36 and rotatable housings 42. The system may also include other pulleys 58 that would provide tensioning of belt 36 and/or other functions for the system. Again, the system may include a first magnetic element 44 that may rotate within rotatable housing 42 such that when the motor is activated, it may translate rotational motion to belt 36, then belt 36 may provide rotational motion to the rotatable housings 42 via pulleys 50 such that rotatable housing 42 may rotate, as may first magnetic element 44, which may be caused by the translated force of the motor assembly and belt.

Furthermore, a second force, namely the magnetic force of second magnetic elements 46, may provide rotation for first magnetic element 44 in another axis such

that when the system is operational, first magnetic element 44 will rotate in more than one axis, simultaneously. First magnetic element 44 may be a permanent magnet, but may be other types of magnetic element, such as, but not limited to an electrically magnetized element. Similarly, second magnetic element 46 may also be a permanent magnet, but may be another type of magnetic element, as desired.

Figure 4 shows a close-up of a rotational housing 42 and first magnetic element 44 according to an exemplary embodiment. A portion of casing 40 may also be shown around rotatable housing 42 with second magnetic element 46 also being shown. It will be appreciated that although second magnetic elements 46 are shown at opposite sides of casing 40, they may be positioned in any position adjacent rotatable housing 42 to affect the rotation of rotatable housing 42 and first magnetic element 44, as desired. This placement may be within rotatable housing 42, casing 40 or other configuration to affect first magnetic element 44.

First magnetic element 44 may have an axle 54 that extends through first magnetic element 44 such that the ends of axle 54 may couple to rotatable housing 42 to allow rotation of first magnetic element 44 with respect to rotatable housing 42 and casing 40. Axle 54 may be rotationally coupled to rotatable housing 42 via bearings, however it will be appreciated that other rotational coupling configurations may be utilized, as desired.

When the system is activated, the rotatable housings 42 and first magnetic element 44 may rotate, which may cause a vibration that may provide massage-like effects to the treatment area, including body parts, and may vibrate the enclosure.

With this configuration, magnetic therapy, as well as vibrational and heat therapy, may be applied to a treatment including, but not limited to, a user's feet or other body part, with this system. Motor assembly 34 may be powered by batteries, an A/C plug, or other methods, as desired. It will be appreciated that although two casings have been shown, each with three rotatable housings and three corresponding first magnetic elements, other configurations, including other numbers and configurations of these portions, may be utilized, as desired.

In closing, it is to be understood that the exemplary embodiments described herein are illustrative of the principles of the present invention. Other modifications that may be employed are within the scope of the invention. Thus, by way of example, but not of limitation, alternative configurations may be utilized in accordance with the teachings herein. Accordingly, the drawings and description are illustrative and not meant to be a limitation thereof.